

REMARKS

The foregoing amendment and the following arguments are provided to impart precision to the claims, by more particularly pointing out the invention, rather than to avoid prior art.

35 U.S.C. § 102(b) Rejections

Examiner rejected claims 1-8, 10-11, 15-16, 18-23, 42 and 44 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,920,574 (hereinafter "Yamamoto").

Examiner rejected claims 1-8, 10-11, 15-16, 18-22, 42 and 44 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,195,020 (hereinafter "Suzuki").

Claim 1 includes a limitation of a thermally conductive material having a substantially planar surface to interface directly with an integrated circuit.

Neither Suzuki nor Yamamoto teaches such a limitation, and therefore neither Suzuki nor Yamamoto anticipate claim 1. Instead, Yamamoto teaches where a layer of solder is necessary to insure full contact between a heat transfer plate and a circuit component (Column 6, lines 11-22). Yamamoto teaches that the solder ensures a cooling efficiency because the solder material creates a thermal connection between the heat transfer plate and the circuit component (Column 5, lines 24-28). Therefore, Yamamoto requires that the heat transfer plate on the circuit component be permanently joined using solder. As a result, Yamamoto does not anticipate claim 1.

Suzuki teaches that a thermally conductive compound layer is necessary to create an interface between a heat transfer plate and a circuit component (Column 7, lines 6-9 and lines 30-34). Suzuki teaches that this layer is necessary for reliable performance (Column 7, lines 51-54). As a result, Suzuki does not teach where a

thermally conductive material has a substantial planar surface to interface directly with an integrated circuit, and Suzuki does not anticipate claim 1.

Further, claim 1 includes the limitation of a flexible channel to allow installation and removal of a conductive material by expanding and contracting the flexible channel. As noted above, Yamamoto teaches where a heat transfer plate is soldered to a circuit component. Therefore, the device must be heated to allow the solder to flow in order to remove the heat transfer plate and bellows from the circuit component (Column 6, lines 19-22). Therefore, because Yamamoto teaches that solder connects a heat transfer plate with a circuit component, Yamamoto does not anticipate claim 1.

Suzuki teaches where a thermally conductive compound layer is inserted between a heat transfer plate and a circuit component. After the layer is created, pressure is applied to the PCB and increased until the pressure exceeds the critical pressure creating adhesion between the heat transfer plate and the circuit component plate (Column 6, lines 50-66). Therefore, because the heat transfer plate and the circuit component are adhered together through a thermally conductive compound layer, the heat transfer plate and the circuit component cannot be separated simply by expanding or contracting the bellows. Further, since the bellows and the conduit taught by Suzuki are filled with coolant (Column 7, lines 22-25), the bellows cannot be easily contracted without and outside force, such as pushing jig 10, acting upon the bellows. Therefore, Suzuki does not anticipate claim 1.

Claims 2-8, 10-11, 15-16, and 18-23 are dependent from claim 1 and therefore include all the limitations of claim 1. Since claim 1 is not anticipated by Yamamoto, claims 2-8, 10-11, 15-16, and 18-23 also are not anticipated by Yamamoto. Further, independent claim 42 includes a limitation similar to those

discussed above regarding claim 1. Therefore, for the same reasons as discussed above, claim 42 is also not anticipated by Yamamoto. Claim 44 depends from claim 42, and therefore includes all the limitations of claim 42. Since claim 42 is not anticipated by Yamamoto, claim 44 is also not anticipated by Yamamoto.

Claims 2-8, 10-11, 15-16, and 18-23 depend from claim 1 and therefore include all the limitations of claim 1. Since claim 1 is not anticipated by Suzuki, claims 2-8, 10-11, 15-16, and 18-23 are also not anticipated by Suzuki. Claim 42 includes a limitation similar to that discussed above. Therefore, because claim 1 is not anticipated by Suzuki, claim 42 is also not anticipated by Suzuki as discussed above. Claim 44 depends from 42 and therefore includes all the limitations of claim 42. Since claim 42 is not anticipated by Suzuki, claim 44 is also not anticipated by Suzuki.

35 U.S.C. § 103(a) Rejections

Examiner rejected claims 9, 12-14, 17, 25-28, 32-35, 43 and 45-46 under 35 U.S.C. 103(a) as being unpatentable over either Suzuki or Yamamoto.

Claims 9, 12-14, 17, 25-28, and 32-35 are dependent from claim 1 and therefore include all the limitation of claim 1. Since claim 1 is not anticipated by Yamamoto or Suzuki, claims 9, 12-14, 17, 25-28, and 32-35 are patentable over Yamamoto or Suzuki. Claims 43 and 45-46 depend from claim 42, and therefore include all the limitations of claim 42. Since claim 42 is not anticipated by Yamamoto or Suzuki, claims 43 and 45-46 are patentable over Yamamoto or Suzuki.

Examiner rejected claims 24 and 29-31 under 35 U.S.C. 103(a) as being unpatentable over either Suzuki or Yamamoto taken with U.S. Patent 5,420,753 (hereinafter "Akamatsu").

Akamatsu teaches away from a combination with either Suzuki or Yamamoto, and therefore claims 24 and 29-31 are patentable over either Suzuki or Yamamoto and Akamatsu. Specifically, Akamatsu teaches that a structure using a thin bellows made of metal is undesirable because coolant leaks may occur, and these leaks may damage the electrical components (Column 2, lines 21-26). Akamatsu specifically teaches an alternative to using a bellows in a cooling system and therefore teaches away from a combination with either Yamamoto or Suzuki. Therefore, claims 24 and 29-31 are patentable over either Suzuki or Yamamoto in view of Akamatsu.

Alternatively, claims 24 and 29-31 depend from claim 1, and therefore include all the limitations of claim 1. Since claim 1 is not anticipated by either Yamamoto or Suzuki, claims 24 and 29-31 are patentable over Yamamoto or Suzuki in view of Akamatsu.

CONCLUSION


Applicant respectfully submits the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Arlen M. Hartounian at (408) 720-8300.

Authorization is hereby given to charge our Deposit Account No. 02-2666 for any charges that may be due.

Respectfully submitted,

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